**STEM Focus Group Meeting – June 18, 2014**

**Prioritize the knowledge and skills important to include in our STEM Curriculum. Include levels for each. Elementary (E), Middle (M), High (H). Add examples.**

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| --- | --- | --- | --- | --- | --- | --- |
| Theme | Knowledge/skills | Examples | Critically  Important | | Moderately  important | Nice to include |
| Problem solving | Learn how to approach problems in the real world  Understand which pieces of data to include | Estimate a solution, imbed math in a problem solving experience | 8th grade + H | | M |  |
|  | Solve technical issues |  | H | | M (clubs) | E |
|  | Develop a culture of logical thinking - connections between subjects | Logical proof | H, M, E  Age appropriate | |  |  |
|  | Build problem solving stamina – apply what is learned, stay with a problem when the solution is not obvious  Failing to solve the problem |  | 9-12 (Groups 1 and 2)  H, M, E (Group 3) | |  |  |
|  | Need balance of group work and individual work  \*Both individual and group grades |  | 6-12 (Groups 1 and 2)  H, M, E (Group 3)  Need individual accountability | |  |  |
| Programming | Learn coding and languages | Lego mindstorms, robotics, Scratch in elementary and middle  JAVA in high school  AP Computer Science  Creation of video games | HTML and Java in middle school; java the one thing they should be exposed to  (Groups 1 and 2)  Needs to progress K-12 Middle school java programmers club in  (Group 3) | | E Science and Math, use creatively to tell a story, start in 3rd grade | Start in K |
|  | Understand the difference between the logic of programming and programming languages. Logic of programming can begin at an earlier age. |  | H, M, E (Group 3) | |  |  |
|  | Develop methodical thinking and other quantitative skills |  | H | | M | E |
| STEAM | Include art- can’t design software without art. | Math in art |  | | H, M | E |
| Science as a process | State and test hypotheses, revise, test. Determine what produces data we can trust. | Even in English - wikipedia Process of trial and error. | Important at all levels, introduce every year in the context of the grade level. (Group 1 and 2)  H (Group 3 | | M | E |
| Participate in a Science fair |  |  | Build in at all levels, even as an afterschool activity | | | |
| Systems thinking and design | Develop broader awareness | Large scale building: life safety, egress, electrical mechanical  Envelope  Internet  Environmental science, burning coal  Body systems | H | M | | E |
|  | Solve technical issues  \*understand how it works, not necessarily how to take apart and put together | How systems and technology function when something fails | 8-12 | M | | E |
| Math | Need basic math foundation first to build confidence | Learn algorithms | E (Group 1 and 2)  E M H Group 3) |  | |  |
|  | Real world applications so students don’t lose interest | Math in medicine, policy, design  Word problems not sufficient | M, H | E | |  |
|  | Students need to learn to decompose a problem and then solve it | Have students talk about their math | H (Group 1 and 2)  H, M, E (Group 3) | M | |  |
|  | Students do not go into “STEM” careers, studies indicate it is about math | AP BC or AB Calc | Not universal. need to make them available.  M Speakers and field trips. |  | |  |
| Statistics/Data analysis | Learn what the formulas mean  Learn to analyze data and form a conclusion | Work with real world data sets instead of a textbook exercise.  Example: Turn census data into a math problem | H (Groups 1 and 2)  H, M, E (Group 3) |  | |  |
| Integrated projects | Critical thinking | Analyze large data sets, write a program to analyze data, summarize in an essay | H |  | | M, E |
| Accounting/budget/finance | Knowing more than how to balance a checkbook | Lunch account, making change  Finance - how to read a bank statement, mortgage | H, M  Finance | E | | Awesome topics from a math point of view |
| World Languages | Start earlier, allow time to learn more than one  Introduce Chinese/Mandarin |  | E (Group 1 and 2)  H, M, E  But not STEM(Group 3) |  | |  |
| Literature and social studies | Critically analyze journal articles instead of just quoting | Ties in with Science as a process; important to quantify things, what do you mean by a lot of people 80% of population | E (Group 1 and 2)  H, M, E (Group 3) |  | |  |